

FERMILAB TEST BEAM FACILITY

2012/13 SHUTDOWN ACTIVITIES

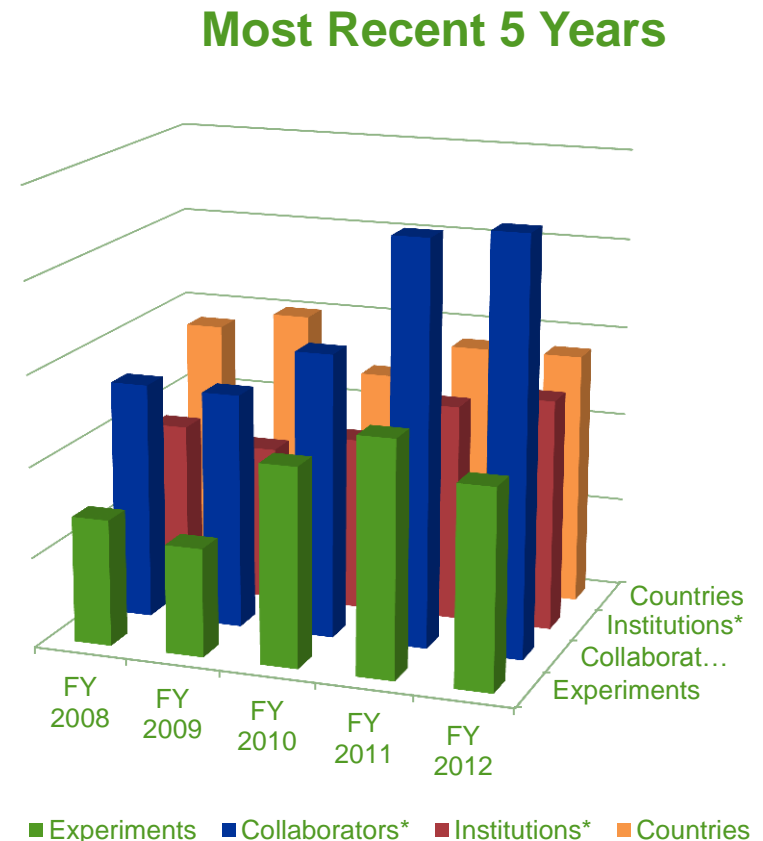
Eugene “JJ” Schmidt

June 17, 2013

On behalf of FTBF staff Aria Soha (**she's back !**), Todd Nebel, Jerry Taccki, Geoff Savage, Ewa Skup with lots of help from Elena Baldina, Mike Cherry, Bill Frank, Mike Geelhoed, Gordon Gillespie, Sten Hansen & company, Joe Howell, Doug Jensen, Mike Matulik, Wanda Newby and more....

The Fermilab Test Beam Facility

- World Class Facility
- The only U.S. HEP Test Beam
- Detector R&D focus
- In 2012:
 - 11 experiments
 - 229 collaborators
 - 64 institutions
 - 14 countries



*Number of *Collaborators* has been scaled to fit on plot

*Number of *Institutions* has been scaled to fit on plot.

◆ FY12 only consisted of 7 months of Beam

Aria Soha's summary of past test beam activities. (See scheduling slide at end.)

MTest Beamline Infrastructure

(work complete unless noted)

- Large main enclosure (MT6.2) insulated to provide better temperature/humidity environment for all experiments. New smaller hut MT6.2C can provide even more cooling for SiPMs or other sensitive detectors.
- Physical infrastructure for HV, signal, and network cables redone with patch panels between enclosures and electronics room. Signal cables between panels have known and uniform lengths.
- Network switches upgraded to support gigabit and wireless coverage expanded to entire area.
- New internet cameras with pan/zoom/tilt installed in all enclosures.
- New laser beam alignment system installed in all enclosures.

MTest Beamline Infrastructure (cont'd)



Insulated MT6.2 Enclosure



New MT6.2C Hut with Motion Table

MTest Beamline Infrastructure (cont'd)

- Control rooms remodeled with new paint, carpet, and furniture.
- Electronics room rearranged to support more racks and separate experimenters' equipment from permanent equipment.
- Motion table control systems redesigned for three tables.
(85% complete – will be done by July)
- Training/practice interlock gate built to reduce downtime due to dropped interlocks during controlled accesses.



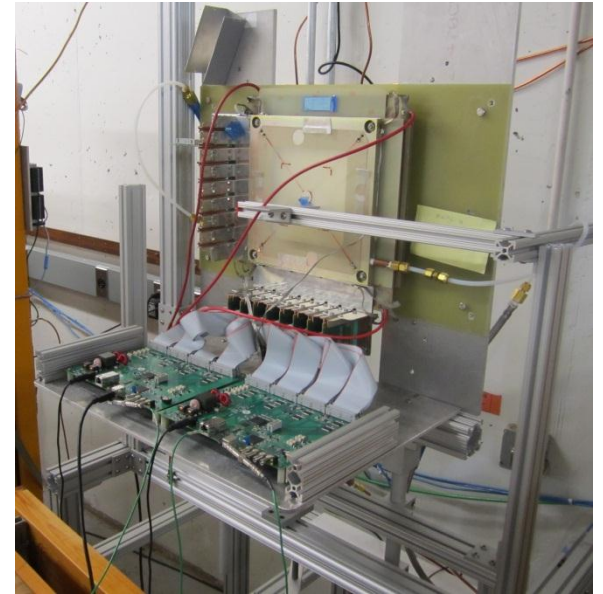
Control Room Remodeled



Controlled Access
Practice Gate

Instrumentation

- Major upgrade to MWPC tracking chambers.
 - Fenker chambers rebuilt with new readout electronics (ASDQ card -> TDC board -> TDC controller board) designed by Sten Hansen.
(all electronics out for fabrication and due by end of June)
 - Extensive testing done to understand optimal gas for efficiency and cost.
 - Extensive work done to lower noise.
 - 5 stations (x-y planes) in production with plans to build at least 4 additional for use in MCenter beamline.



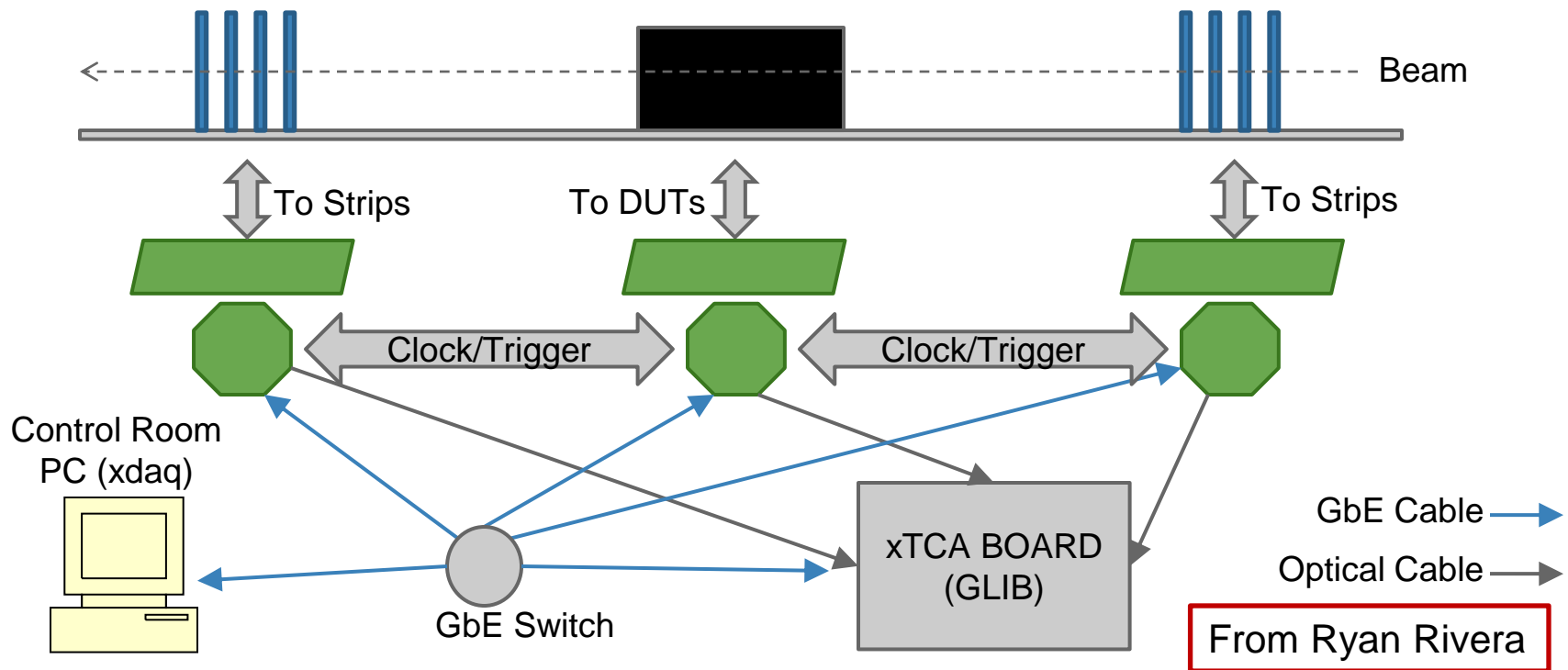
New MWPC Testing

Instrumentation (cont'd)

- Electronics System Engineering group in the SCD is building a new Silicon tracking telescope with initial testing in early July. See following slide for details. This allows for very high precision tracking for a device under test.

Silicon Strips-Based Telescope for FTBF

- The Detector Instrumentation Group of ESE/SCD in collaboration with Purdue University will commission a new strips telescope when the beam returns this summer. The telescope will be available to provide precision tracking for users as part of the Fermi Test Beam Facility.
- Telescope DAQ includes CAPTAN (Fermi design), MicroTCA GLIB (CERN design), and xdaq (CMS software framework).
- Will leverage past experience of CMS pixels-based telescope and CAPTAN DAQ.
- Features: up to 16 planes with 60 micron D0 strip sensors, large active area (up to 8cm x 8cm, 25x area of pixel telescope), ~5 micron resolution anticipated, real-time track reconstruction in MicroTCA form factor.
- The strip readout chip is the FSSR2, which was designed at FERMILAB for the BTeV strip detector.



Facility Expansion - MCenter

- MCenter beamline is being recommissioned to provide additional resources for larger and longer term test experiments.
- Four primary magnets still need to be changed out – waiting on personnel resources to be freed from shutdown work.
- Radiation assessment underway.
- Upstream MC7 area cleared out for experiments and physical infrastructure (ductwork, electrical, signal and HV cables) put in place.
- Tertiary beamline with power has been moved but not fully configured.
- Working on Cherenkov and MWPCs for this area.
- Plans are underway to make old MWest beamline stub into control room.
- First customer is T-1034: LArIAT – “Liquid Argon in a Testbeam” with first phase using the *ArgoNeuT* cryostat which is in place. Cryogenics system in design phase.
- Target timetable is fall of 2013.

Facility Expansion - HRT

- “High Rate Tracking Area” is under development in an MT3 alcove upstream of secondary target for MTest beamline. Flux is $\sim 1\text{E}12/\text{minute}$ and two customers are scheduled for late summer and early fall.
- Electrical power, networking, signal, and HV cables are in place.
- Tap into LCW will be done soon.
- Beam intensity monitor based on SeaQuest design will be permanent addition to area.
- Three electronics racks have been setup in MS3 for “control room”.
- Motion table under design for this area.



MT3 High Rate Tracking Area



HRT racks at MS3

Experiments Coming Soon

- List of approved or submitted experiments can be found at <http://www-ppd.fnal.gov/FTBF/TSW/index.html> .
- Partial list....
 - T-1042: Muon g-2 straw tracker
 - T-1041: CMS Forward Calorimetry R&D
 - T-1038: PHENIX Muon Piston Calorimeter APD and Prototype MPC Extension Tests
 - T-1037: FLYSUB: Consortium Tracking and RICH Performance Evaluation
 - T-1036: Tests of high rate pixel detector
 - T-1034: LArIAT: Liquid Argon TPC in a Test Beam
 - T-1031: ATLAS Tile Calorimeter Upgrade Electronics Tests
 - Other returning experiments
 - Expressions of interest from many more.

Scheduling Notes

- Testbeam experiments tend to come for one or two week periods. Some digest results and return one or more times.
- FY2012 had 229 collaborators from 64 institutions and 14 countries. *(That's a lot of people ! No double counting either.)*
Schedule changes/slips have an especially large impact on the testbeam program. We can not just slide the program forward and ask multiple groups to change plans and travel.
- Aria accepted no schedule requests until January of this year and then padded early beam time with FTBF wire chamber commissioning and beam studied. We scheduled first experiments for July 3.
- We are now scrambling to rebook everyone after September 1.
- We have a request for three weeks in May of 2014 (not a local group).
- Bottom line: We need to know as soon as possible when schedules slip and need to be kept informed of potential plans for future shutdowns. Please don't forget about us 😊